



## **Cancer Facts About Missouri Right Now, 2004**

### **The BURDEN of CANCER in MISSOURI**

**by the Missouri Cancer Consortium and the  
Missouri Department of Health and Senior Services**

## Dear Neighbors:

Unfortunately, cancer affects three out of four Missouri families. Cancer is the second leading cause of death for Missourians. More than 28,000 new cases are diagnosed each year in Missouri, and over 12,000 lives are claimed by cancer. But not just the patient is burdened. The word “cancer” evokes fear in many and can impact the quality of life and cause additional burdens to the patient and their circle of family, friends and supporters. These other burdens may include financial hardship as families adjust to increasing medical bills and insurance premiums, lost time at work and wages, as well as an economic impact on employers.



However, there is good news that healthy behaviors increase the chance of being cancer free. According to the Harvard School of Public Health, *Harvard Report on Cancer Prevention Volume 1*, “it is estimated that 65% of all cancers can be linked to poor diet, sedentary lifestyle, and tobacco use.” Studies prove that people can greatly reduce the risk of cancer by choosing a healthier lifestyle, which not only reduces cancer risks but also increases chances of survivability if diagnosed. Everyone should be encouraged to:

- Avoid tobacco products and second-hand smoke
- Eat healthy and nutritious food
- Get recommended cancer screenings at appropriate intervals
- Increase physical activity

This report describes the cancer burden in Missouri and how each of us can make a difference in reducing our risk of developing cancer and dying from this disease. Following an overview of the issues, this report describes the burden of individual cancers and opportunities for prevention and early detection. The final part of this report briefly describes issues related to survivorship and disparities. The Missouri State Cancer Plan addresses the whole continuum of cancer care including – 1) prevention, 2) early detection and diagnosis through appropriate cancer screenings, 3) treatment and care including pain management, and 4) survivorship. To reduce cancer cases and mortality is a tremendous job, one that will take bravery and boldness to tackle this epidemic. The Missouri Department of Health and Senior Services, through its partnership with other health care professionals, agencies, and local coalitions, will continue to address this cancer burden and deliver a positive cancer message to our communities. As can be seen from this report, there are many opportunities for Missourians to reduce their risk of developing cancer. The reality will then become Missourians replacing the fear of cancer with better health enjoyment. Please lend your support and help achieve this goal.

Sincerely,  
**Paula F. Nickelson**, Director  
 Division of Community Health  
 Missouri Department of Health and Senior Services

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The statistics in this report show the reality of cancer in Missouri; however, there have been positive strides in reducing the burden through increased public education and awareness, early detection and screening which ultimately will increase survivorship. All Missourians benefit when people live longer, healthier, cancer-free lives. The burden is great, but the hope is greater.

Sincerely,  
**Michael Bukstein, M.D.**  
 Chair, Missouri Cancer Consortium

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## Cancer Overview

### What is Cancer?

Cancer is a group of diseases characterized by uncontrolled growth and spread of abnormal cells. If the spread is not controlled, it may result in death. Most types of cancer cells form a lump or mass called a tumor and are named after the part of the body where the tumor originates. Cancer is caused by both external factors (for example, tobacco, chemicals, radiation and infectious organisms) and/or internal factors (for example, hormones, immune conditions and genetic mutations).

### How Many Missourians Today Will Get Cancer?

In the years to come, cancer will affect approximately three of every four Missouri families; about two in five Missourians, now living, will eventually develop cancer. Nationally, men have a little less than a one in two lifetime risk of developing cancer; for women, the lifetime risk of developing cancer is a little more than one in three.

### How Many New Cases of Cancer Will Occur This Year in Missouri?

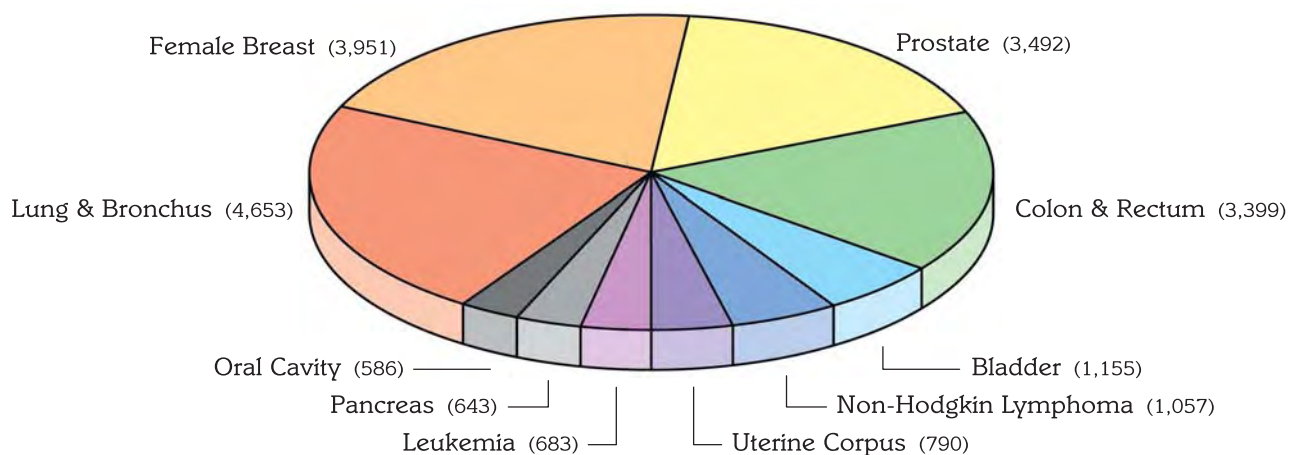
In 2004, approximately 30,290 Missourians are expected to be diagnosed with cancer and about 12,480 are expected to die of the disease according to the American Cancer Society. This amounts to three new cases of cancer diagnosed every hour of every day. These estimates do not include non-melanoma skin cancer and carcinoma in situ (for sites other than the urinary bladder).

### Who is at Risk of Developing Cancer?

Anyone in Missouri is at risk of developing cancer. Although cancer may strike at any age, it is mostly a disease of middle and old age. About 78% of all cancers in Missourians are diagnosed at age 55 or older. With an average of 12,157 deaths annually during 1999-2000, cancer is second only to heart disease (average of 17,668 deaths annually) as the leading cause of death among adults in Missouri.

### Top 10 Leading Types of New Cancer in Missouri Residents, 1996-2000\*

\*The number in parenthesis is the average number of invasive cases diagnosed per year for this time period.



\*Data from the DHSS-Missouri Cancer Registry.



## Can Cancer Be Cured?

Yes. In general, if a person's cancer has been in remission for five years (all signs and symptoms of the disease are absent), the cancer is considered cured. However, cancer may still recur after this time period. The length of remission at which a person is considered cured differs for various kinds of cancer. Certain types of skin cancer are considered cured as soon as the lesion is removed. With other cancers, eight to ten years must pass before the person is considered cured.

## What is the Economic Burden of Cancer in Missouri?

While the most important cost of cancer is the loss of lives, the huge economic burden of cancer can not be ignored. The Centers for Disease Control and Prevention (CDC) estimates that the direct and indirect cost of cancer in the United States was \$170 billion in 2002. This estimate includes about \$60 billion in medical costs and \$110 billion for lost productivity. This means that with a population of 5.7 million, the economic cost for cancer in Missouri was \$3.3 billion, or approximately \$585 for each person.

According to a recent study, medical costs for cancer have steadily increased from 1963 to 1995, amounting to billions of additional dollars. This is partly due to the emergence of more expensive treatment modalities for each type of cancer. With the continuing development of new therapies and the increasing elderly population in Missouri, the cost is expected to increase substantially during the next decade.

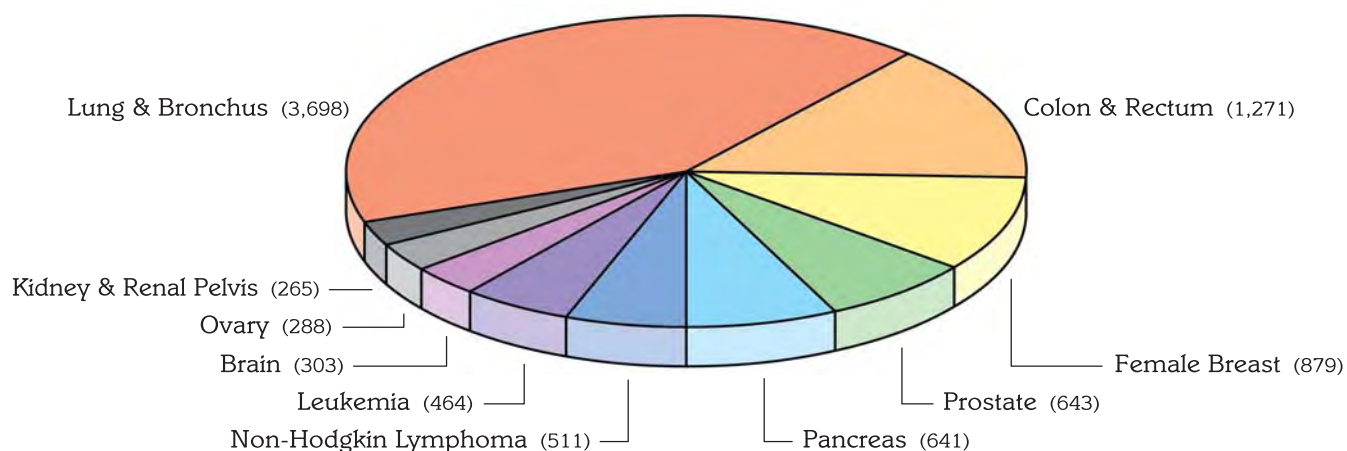
## Could More People Be Saved?

Yes. More than half of cancers are preventable by taking advantage of current knowledge. According to the American Cancer Society, one-third of cancer deaths can be prevented through lifestyle changes such as eliminating tobacco use, improving dietary habits, exercising regularly, maintaining a healthy weight, avoiding exposure to the sun's rays, and obtaining cancer-screening tests. Certain cancers that are related to infectious exposures such as Hepatitis B, human papillomavirus (HPV), human immunodeficiency virus (HIV), *heliobacter*, and others, could be prevented with behavioral changes, vaccines and antibiotics.

Smoking causes about 30% of all U.S. cancer deaths. Avoiding tobacco use is the single

## Top 10 Leading Causes of Cancer Death of Missouri Residents, 1999-2000\*

\*The number in parenthesis is the average number of deaths per year for this time period.

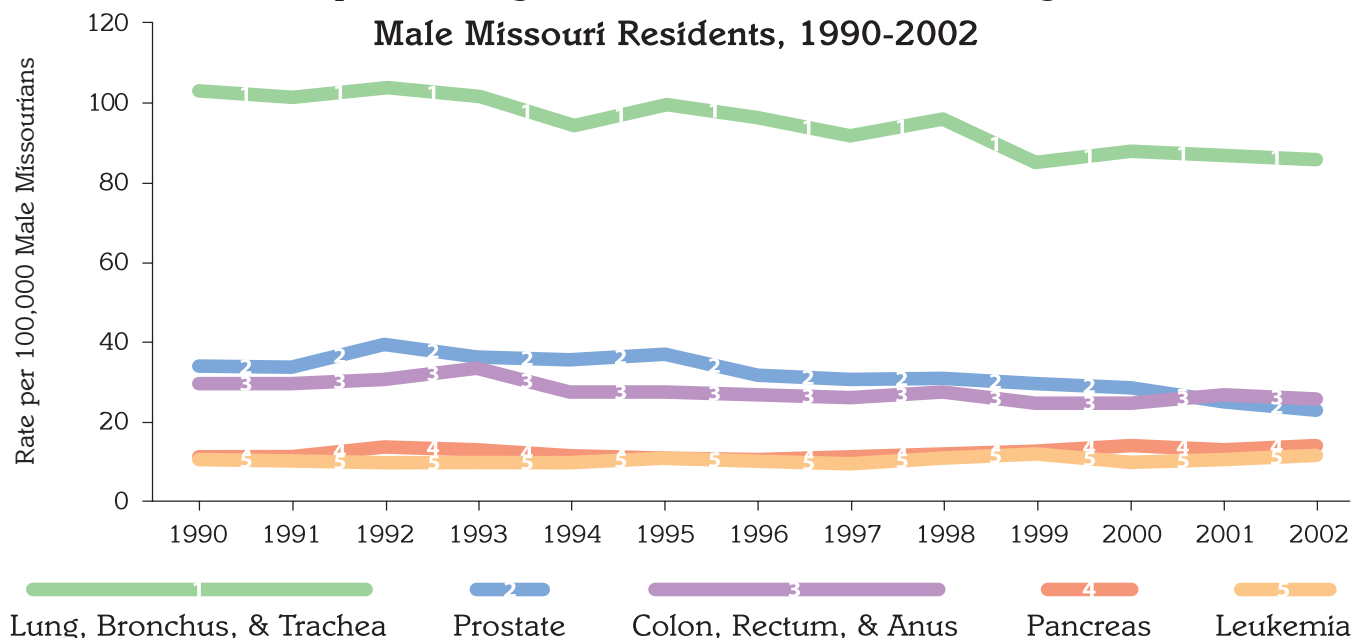


\*Data were compiled by the Missouri Cancer Registry using data files provided by DHSS-Center for Health Information Management and Evaluation (CHIME).

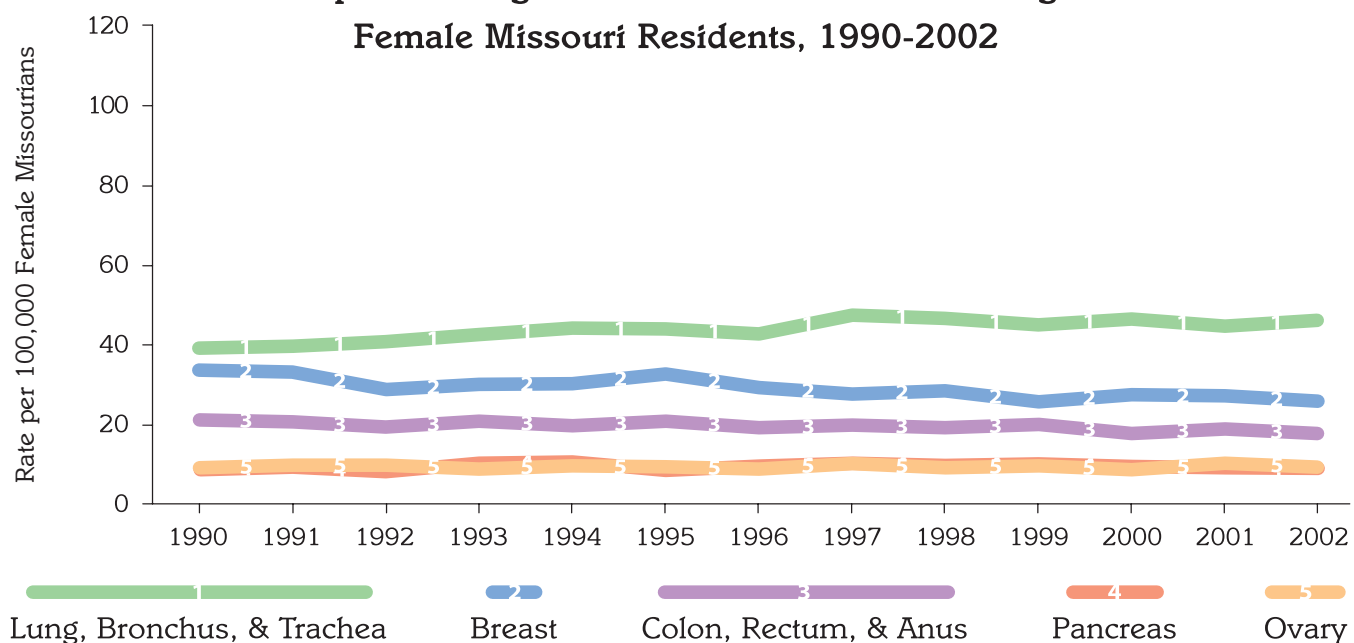
most important step Americans can take to reduce the cancer burden in this country. Key aspects of improving nutrition include modifying diets to lower consumption of animal fat; increasing consumption of grains, fiber, fruits and vegetables, and limiting alcohol use.

Early diagnosis saves lives by identifying cancers when they are most curable. Five-year relative survival rates for common cancers such as breast, prostate, colorectal, cervical and melanoma of the skin are 90 to 100%, if they are discovered and treated before spreading beyond the organ where the cancer began. Screening for several cancers has been shown to be effective but is underutilized.

### Top 5 Leading Causes of Cancer Death Among Male Missouri Residents, 1990-2002



### Top 5 Leading Causes of Cancer Death Among Female Missouri Residents, 1990-2002



\*Data from the Missouri Department of Health and Senior Services, Missouri Information for Community Assessment (MICA). 04/04/04.  
Age-adjusted rates using 2000 U.S. standard population.

# Leading Sites of New Cancer Cases and Death for Missouri Residents\*

| Female                                 |  | Male                                |                                   |
|--|--|-------------------------------------|-----------------------------------|
| New Cases Annually<br>(1996-2000)      | Deaths Annually<br>(1999-2000)         | New Cases Annually<br>(1996-2000)   | Deaths Annually<br>(1999-2000)    |
| Breast<br>3,951 (30%)                  | Lung & Bronchus<br>1,529 (26%)         | Prostate<br>3,492 (26%)             | Lung & Bronchus<br>2,169 (35%)    |
| Lung & Bronchus<br>1,910 (14%)         | Breast<br>879 (15%)                    | Lung & Bronchus<br>2,743 (20%)      | Prostate<br>643 (10%)             |
| Colon & Rectum<br>1,708 (13%)          | Colon & Rectum<br>665 (11%)            | Colon & Rectum<br>1,691 (12%)       | Colon & Rectum<br>607 (10%)       |
| Corpus Uteri & Uterus, NOS<br>790 (6%) | Pancreas<br>330 (6%)                   | Urinary Bladder<br>861 (6%)         | Pancreas<br>311 (5%)              |
| Non-Hodgkin Lymphoma<br>505 (4%)       | Ovary<br>288 (5%)                      | Non-Hodgkin Lymphoma<br>552 (4%)    | Leukemia<br>261 (4%)              |
| Ovary<br>429 (3%)                      | Non-Hodgkin Lymphoma<br>261 (4%)       | Kidney & Renal Pelvis<br>433 (3%)   | Non-Hodgkin Lymphoma<br>250 (4%)  |
| Pancreas<br>332 (2%)                   | Leukemia<br>204 (3%)                   | Oral Cavity and Pharynx<br>398 (3%) | Esophagus<br>173 (3%)             |
| Uterine Cervix<br>304 (2%)             | Brain<br>150 (3%)                      | Leukemia<br>379 (3%)                | Urinary Bladder<br>154 (2%)       |
| Leukemia<br>304 (2%)                   | Corpus Uteri & Uterus, NOS<br>142 (2%) | Melanoma of the Skin<br>328 (2%)    | Brain<br>154 (2%)                 |
| Kidney & Renal Pelvis<br>300 (2%)      | Multiple Myeloma<br>113 (2%)           | Pancreas<br>311 (2%)                | Kidney & Renal Pelvis<br>153 (2%) |
| Other Cancers<br>2,955 (22%)           | Other Cancers<br>1,327 (23%)           | Other Cancers<br>2,438 (18%)        | Other Cancers<br>1,394 (22%)      |
| All Sites<br>13,280 (100%)             | All Sites<br>5,888 (100%)              | All Sites<br>13,626 (100%)          | All Sites<br>6,269 (100%)         |

\*Excludes basal and squamous cell skin cancer and in situ cancer except urinary bladder. Percentages may not total 100% due to rounding. Case and death data were compiled by the Missouri Cancer Registry. Death data were compiled using files provided by DHSS-Center for Health Information Management and Evaluation (CHIME).



## Cancer of the Lung and Bronchus

### Bottom Line

Lung cancer is the number one cause of cancer death in the United States, killing more than 160,000 Americans every year, including nearly 3,700 Missourians. Tobacco use is the leading cause of lung cancer. Other causes include exposure to secondhand smoke, exposure to asbestos and prolonged exposure to environmental radon. Presently, there are no effective methods to detect lung cancer in an early, more treatable stage, but studies are currently underway. Prevention is the most important factor in eliminating lung cancer. Almost 90% of lung cancers could be avoided by not smoking.

### Cancer Burden

Lung cancer is the most common cancer in Missouri and the leading cause of cancer death among men and women. Lung cancer causes more deaths every year than do colorectal, breast, cervical, and prostate cancers combined.



Between 1996 and 2000, an average of 4,653 new cases of lung cancer was diagnosed each year in Missouri. Lung cancer incidence rates in Missouri (110.6 per 100,000 for men and 59.1 per 100,000 for women from 1996-2000) are significantly higher than rates reported by the Surveillance, Epidemiology, and End Results (SEER) program (80.6 per 100,000 for men and 49.6 per 100,000 for women from 1996-2000). The SEER program is a collection of cancer registries covering about ten percent of the U.S. population, including Connecticut, Hawaii, Iowa, Utah, and New Mexico as well as the metropolitan areas of San Francisco, Detroit, Atlanta and Seattle/Puget Sound. The SEER program is the only comprehensive source of population-based information in the United States that includes stage of cancer at the time of diagnosis and survival rates within each stage. The mortality data reported by SEER is provided by the National Center for Health Statistics.

During 1999 and 2000, an average of 3,698 Missourians died from lung cancer each year. The lung cancer mortality rate in Missouri (62.7 per 100,000 from 1999-2000) was 13% higher than the national mortality rate (55.7 per 100,000).

Like most cancers, lung cancer occurs more frequently among older people. Despite the fact that lung cancer most frequently affects older people, the population most at risk for eventually developing lung cancer are current smokers. However people of all ages, even children of middle school age, are becoming tobacco users, which will produce negative results in future years.

Nationally, approximately 23.0% of adults reported smoking (a decrease from 42.4% in



1965). Despite this encouraging national trend, 26.5% of Missouri adults reported that they smoked at least some days in 2002. Missouri ranked eighth in the percentage of adults and 28th in youth 12-17 years of age who smoked in the United States in 2001. More than one out of every seven adolescents (15.1%) in Missouri reported that they smoked in 2001.

## Prevention and Early Detection

Preventing the start or stopping the use of tobacco could nearly eliminate lung cancer. Although lung cancer has been reduced among some groups in recent years, a significant percentage of Americans – including adults, adolescents, and children – continue to smoke and use tobacco in some form.

Secondhand smoke – also known as environmental tobacco smoke – is produced from a burning cigarette, pipe, or cigar, plus what the smoker exhales. Tobacco is known to contain at least 60 cancer-causing agents. People who are exposed to secondhand smoke inhale these chemicals, just as smokers do, although at a lower level. According to the U.S. Environmental Protection Agency, secondhand smoke causes about 3,000 lung cancer deaths in the United States each year among nonsmokers.

Radon – an invisible, odorless, tasteless gas that is released from rocks and soil – enters homes through cracks and holes in the foundation. Radon is second only to tobacco as the leading cause of lung cancer. Radon may contribute to as many as 20,000 lung cancer deaths in the United States each year. Researchers estimate that lowering indoor radon exposure could prevent about 30% of lung cancer deaths from radon. Only 18% of Americans who were aware of radon lived in homes actually tested for radon.

Routine exams to detect lung cancer have not been shown to reduce mortality. Chest x-ray, analysis of cells contained in sputum, and fiber optic examination of the bronchial passages have all shown only limited effectiveness in early detection of lung cancer. Newer tests, such as low-dose spiral computed tomography (CT) scans and molecular markers in sputum, are currently being evaluated in scientific studies.

New efforts are underway to prevent the development of the disease and to stop or reverse the progression of premalignant lesions through the use of natural or synthetic agents (chemoprevention). Although still in its infancy, targeted molecular therapies may offer the opportunity to make chemoprevention a viable modality in preventing or treating lung cancer in the future.

Prevention is the most important factor in eliminating lung cancer.

**Almost 90% of all lung cancer deaths are attributed to tobacco usage.**



## Disparities

From 1996-2000, the lung cancer incidence rate among African Americans in Missouri was 96.2 per 100,000 compared to 79.3 per 100,000 for whites. Lung cancer incidence rates among both male and female African Americans in Missouri were substantially higher than the rates for African Americans covered by the SEER program. In Missouri, from 1996-2000, lung cancer incidence rates for African-American men averaged 144.6 per 100,000 and for African-American women averaged 64.0 per 100,000 compared to the SEER rates of 120.4 and 54.8 per 100,000, respectively.

Additional differences by race are seen in mortality data. In Missouri, from 1999-2000, lung cancer mortality rates were significantly higher than national rates: 114.6 per 100,000 for African-American men and 51.6 per 100,000 for African-American women compared to national rates of 102.0 and 39.8 per 100,000 for African-American men and for African-American women.

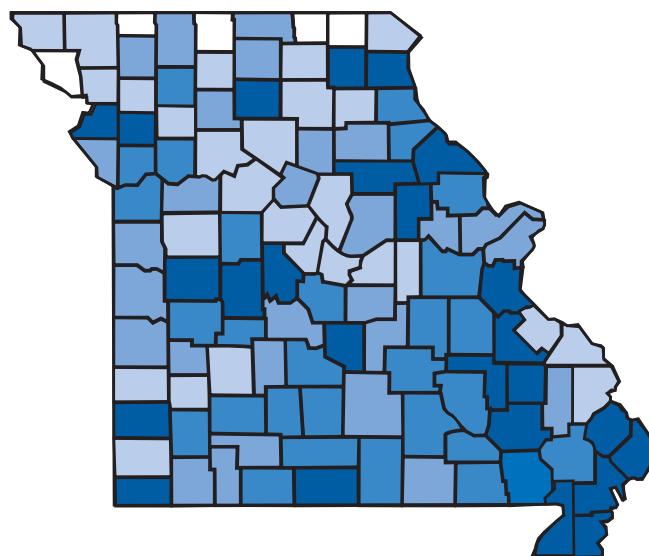
Lung cancer incidence rates vary three-fold across Missouri. The lowest incidence rates during 1996-2000 were seen in Ste. Genevieve County (40.4 per 100,000); the highest rates were found in Benton County (120.0 per 100,000).

Geographic variation in mortality rates was also reported in Missouri. The average annual mortality rates from lung cancer varied nearly three-fold across Missouri. The mortality rate in Johnson County was among the lowest (43.7 per 100,000), while the highest mortality rate was found in Reynolds County (123.6 per 100,000) among Missouri counties reporting more than 10 lung cancer deaths per year.

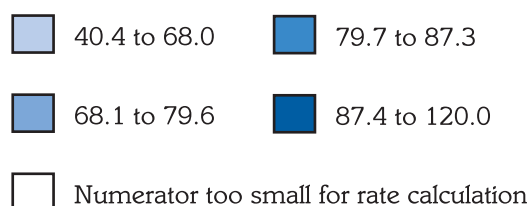
Data from the 2002 Missouri Behavioral Risk Factor Surveillance System indicated that men were more likely to smoke than women (29.6% vs. 23.8%); those who did not complete a high school education were more likely to smoke (37.3%) than those who completed high school (30.9%) and those with at least some college education (25.9%). In addition, African Americans (36.5%) were more likely to smoke than whites (25.4%).

Smoking varied nearly three-fold across Missouri's counties. In Adair and Schuyler counties, 14.4% percent of persons age 18 or older were current smokers compared to 39.4% among residents of Stoddard and New Madrid counties.

### Lung & Bronchus Cancer Incidence Rates by County 1996-2000



Colors indicate age-adjusted rate of cancer of the lung & bronchus in that county, per 100,000 residents.



\*1996-2000 data from the Missouri Cancer Registry.

## Colon and Rectum Cancer

### Bottom Line

Screening tests offer a powerful opportunity for the prevention and early detection of colorectal cancers. Although people cannot change their genetic makeup, most can reduce their risk of colorectal cancer by following screening guidelines, eating a low-fat, high-fiber diet, and participating in physical activity.

### Cancer Burden

Colorectal cancer is the third most common cancer in both men and women, nationally and in Missouri. An average of 3,399 Missourians developed colorectal cancer annually during 1996 to 2000, and an average of 1,271 Missourians died of the disease each year during 1999-2000.

The average annual incidence rate of colorectal cancer in Missouri from 1996 to 2000 (58.6 per 100,000) was slightly higher than the incidence rate for the SEER program (54.2 per 100,000). Nationally, long-term declines in colorectal cancer incidence have slowed or stabilized since the mid-1990s, whereas declines in death rates have continued. Mortality rates have dropped 23% over the past two decades nationally, but Missouri's mortality rate declined only 14%. Missouri's annual mortality rate of 21.4 per 100,000 was very similar to the national rate of 20.8 per 100,000 from 1999-2000.

Increased use of sigmoidoscopy or colonoscopy, which in turn has increased polyp removal, has been suggested as one possible reason for the decline in incidence and mortality rates. Unfortunately, risk factors

for colorectal cancer, such as a sedentary lifestyle, obesity, and an unhealthy diet, have also increased over time and may adversely affect incidence and mortality rates.



### Prevention and Early Detection

Obtaining appropriate screening for polyps as well as modifying behavioral risk factors greatly reduces the chances for colorectal cancer. Research suggests that aspirin-like drugs, postmenopausal hormones, folic acid, calcium supplements, selenium, and vitamin E may also help prevent colorectal cancer. At least 70% of colon cancers could be prevented by healthy behaviors that include – 1) maintaining a healthy body weight, 2) participating in moderate daily physical activity, 3) limiting red meat intake, 4) not smoking, 5) taking a multiple vitamin, and 6) avoiding high alcohol intake.





Colorectal cancers can be cured if they are detected early. Screening tests, such as colonoscopy, sigmoidoscopy, and fecal occult blood testing, can detect colon polyps (tissue growths) even before they become cancerous, as well as early-stage colorectal cancers. Scientific research and development continue in an effort to identify earlier detection of colorectal cancer through minimized screening methods. One such method is by examination of computer-generated images from an abdominal computer tomographic (CT) examination. These images simulate the effect of a conventional colonoscopy and if polyps are found, it then becomes necessary to perform a follow-up conventional colonoscopy. These methods are promising, but more research is needed before they are used in routine medical practice. While persons at average risk of colorectal cancer should be screened starting at age 50, individuals with a family history of colorectal cancer or adenomatous polyps in a first-degree relative (in a parent or sibling before age 60 or in two first-degree relatives of any age); a personal history of colorectal cancer, polyps, or chronic inflammatory bowel disease; or persons with a family history of hereditary colorectal cancer syndrome should consider screening prior to age 50. However, most colorectal cancers occur in people over age 50 with no predisposing factors.

In 2002, only 44.2% of Missourians aged 50 and over reported having had a sigmoidoscopy or colonoscopy exam.

## Disparities

Colorectal cancer mortality rates among African Americans in Missouri dropped from 36.1 per 100,000 in 1990 to 30.6 per 100,000 in 1998, a 15% decline. However, a striking racial disparity remains. For 1999-2000, the colorectal cancer mortality rates were 31.3 for African American versus 20.6 for white Missourians.

For both men and women, the Missouri death rates for African Americans are also slightly higher than the national rates for African Americans: 38.3 per 100,000 in Missouri versus 34.5 per 100,000 nationally for African-American men and 26.8 versus 24.3 for African-American women.

As the above rates show, African-American men bear the highest burden of colorectal cancer in Missouri. In contrast to their colorectal cancer mortality rate of 38.3 per 100,000, the corresponding rate for white men was 24.1 per 100,000; and for white women, it was 18.1 per 100,000. Although there is clearly a gender disparity, with male rates higher than female (25.0 versus 18.7), the racial disparity is greater.

**Screening tests, such as colonoscopy, sigmoidoscopy, and fecal occult blood testing, can detect colon polyps (tissue growths) even before they become cancerous, as well as early-stage colorectal cancers.**

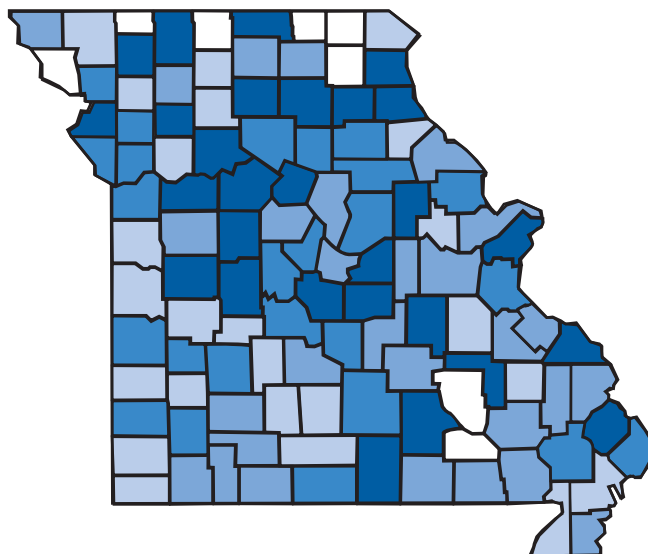


During 2001, 34.7 percent of Missourians aged 50 or older reported that they had a sigmoidoscopy or colonoscopy within the previous five years. In Missouri, socioeconomic factors, such as educational attainment and household income, did not seem to affect the use of colorectal cancer screening. Nationally, persons without a usual source of medical care (e.g., a physician) and those without health insurance were least likely to be screened for colorectal cancer.

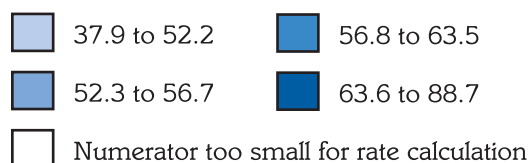
The use of sigmoidoscopy and colonoscopy within the previous five years among persons age 50 or older varies across Missouri's counties from a low of 14.4% in Adair and Schuyler counties to a high of 57.1% in St. Louis County.

**Colorectal cancers can almost always be cured if they are detected early.**

## Colon & Rectum Cancer Incidence Rates by County 1996-2000



Colors indicate age-adjusted rate of cancer of the colon & rectum in that county, per 100,000 residents.



\*1996-2000 data from the Missouri Cancer Registry.

## Breast Cancer

### Bottom Line

Breast cancers can be treated successfully if detected early. Obtaining an annual mammogram and clinical breast examination starting at age 40 is the most effective way to detect breast cancer at an early, treatable stage. A number of risk factors for breast cancer have been identified, but most women do not have any known risk factors at the time of their diagnosis. Some risk factors for breast cancer, such as family history and age, cannot be changed. Other factors are modifiable; women may reduce their risk of developing breast cancer by:

- 1) staying physically active;

- 2) avoiding midlife weight gain;
- 3) avoiding prolonged use of hormone replacement therapy; and
- 4) avoiding daily alcohol consumption.

Even so, the proportion of breast cancer attributable to these individual risk factors has been typically less than 10%.

### Cancer Burden

Excluding all cancers of the skin, breast cancer is the most common cancer among women in Missouri and accounts for nearly one-third of all cancers diagnosed in women. Between 1996 and 2000, an average of 3,951

cases of breast cancer per year were diagnosed among Missouri women for an incidence rate of 127.7 per 100,000 women. Missouri's breast cancer incidence rate is similar to the incidence rates for most Midwest states and slightly lower than among the cancer registries that are part of the Surveillance, Epidemiology, and End Results (SEER) program.

An average of 879 deaths from breast cancer among women were reported annually in Missouri during 1999-2000. Only lung cancer accounts for more cancer deaths in women. Missouri's mortality rate for female breast cancer, 26.6 per 100,000, is essentially the same as the national rate of 26.6 per 100,000 during 1999-2000.



### Prevention and Early Detection

Maintaining a healthy weight through lifestyle factors such as regular physical activity and a low-fat diet may reduce the risk of breast cancer. Postmenopausal hormone therapy may increase the risk of breast cancer, although there is little known risk associated with the use of oral contraceptives. The risk of

developing breast cancer increases with age. Nationally, 95% of new breast cancer cases and 97% of breast cancer deaths occurred in women aged 40 and older.

Women with a family history of breast cancer, especially a first-degree relative (mother, sister, or daughter diagnosed premenopausally) have an increased risk of developing breast cancer themselves. Following genetic counseling, management of risk factors, such as removal of ovaries or breasts, may help these women reduce their chances of getting breast cancer, especially women who are genetically at increased risk.

At this time, there is no guaranteed way to prevent breast cancer for women who are at average risk, which is why screening via mammography and clinical breast examination is so important. Mammography can detect breast cancer about two years earlier and at a smaller, more treatable size, often before physical symptoms develop. Studies have shown that early detection, followed by prompt, appropriate treatment, saves lives and increases treatment options.

Chemoprevention, the use of natural or synthetic agents to reverse, suppress, or prevent premalignant molecular or histologic lesions from progressing to invasive cancer, is being investigated through scientific studies, but is currently available only for women at significantly increased risk for developing breast cancer. Different strategies are being pursued to improve the risk:benefit ratio of breast cancer chemoprevention intervention.

In 1999-2000, 57.8% of women aged 40 and older surveyed by the Missouri Behavioral Risk Factor Surveillance System reported that they had a mammogram in the past year, up from 45.4% in 1990. Nationally for the period of 1999-2000, 61.3% of women age 40 and older

surveyed reported that they had a mammogram in the past year. In Missouri, 88.9% of new cases and 93.4% of breast cancer deaths during 1999-2000 occurred in women ages 45 and older.

## Disparities

Nationally, over the past decade, the difference in screening rates for white and African-American women narrowed, while the percentage of Hispanic women screened for breast cancer remained low. Screening rates have increased to where 61.6% of African-American women and 62.4% of white women reported that they had a mammogram in 1999-2000 nationally. In Missouri during 1999-2000, 68.5% of African-American women aged 40 and older surveyed as part of the Missouri Behavioral Risk Factor Surveillance System reported that they had a mammogram in the past year, relative to 57.5% of white women. Screening rates for African-American women are based on smaller sample sizes than for white women; therefore, caution should be used in interpreting these percentages.

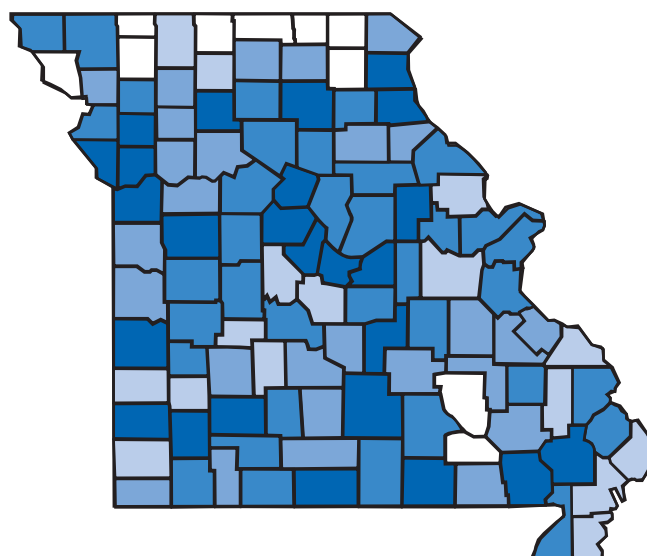
Despite the narrowing of screening rates differences between white and African-American women over time, a recent study found that nationally, low-income women and women with limited access to medical care remained significantly less likely to have received mammograms compared to women with higher incomes and those with better access to medical care.

The 2003 Missouri county-level survey reported significant geographic variation in breast cancer screening. For example, only 34.2% of women 50-64 years of age in McDonald and Barry counties reported having a mammogram and a clinical breast examination in the past year relative to 82.7% of women in Clay-Platte counties.

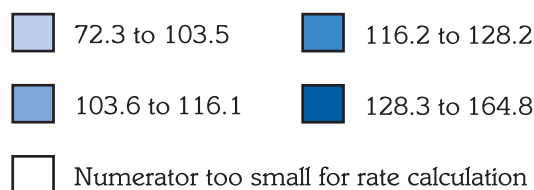
While breast cancer incidence rates were five percent higher among white females (127.9 per 100,000) than among African Americans (121.7 per 100,000) in Missouri during 1996-2000, mortality from breast cancer was 31% higher among African-American females during 1999-2001.

In Missouri, the breast cancer death rate for white Missourians is significantly lower at 25.8 from 1999-2000. The mortality rate for breast cancer among African-American females from 1999-2000 was 34.8 per 100,000. This was the same as the national average during this time period.

**Female Breast Cancer Incidence Rates  
by County 1996-2000**



Colors indicate age-adjusted rate of cancer of the female breast in that county, per 100,000 women.



\*1996-2000 data from the Missouri Cancer Registry.

## Prostate Cancer

### Bottom Line

Prostate cancer is the most common type of cancer for men nationally and in Missouri other than skin cancer, and the second leading cause of cancer death in men after lung cancer. Age is the main risk factor for prostate cancer. At present, several national organizations recommend informed decision making about testing for prostate cancer rather than recommending that all men be screened for the disease. Men 50 years and older should talk to their doctors about their risk for prostate cancer and the importance of digital rectal exams (DRE) and prostate-specific antigen (PSA) tests to detect prostate cancer early. The American Cancer Society recommends that men at high risk (African-American men and men who have a first-degree relative diagnosed with prostate cancer) should begin testing at age 45. Men should discuss an abnormal DRE or PSA with their doctors, especially since it is currently not clear if all men need to be treated immediately for prostate cancer or if watchful waiting is the appropriate course of action.

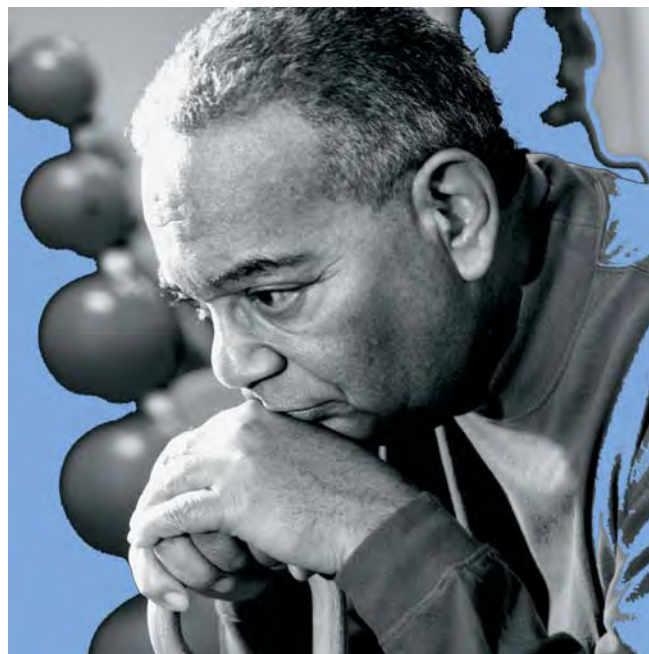
### Cancer Burden

An annual average of 3,492 Missouri men was diagnosed with prostate cancer in 1996-2000. An average of 643 cancer deaths each year was due to prostate cancer during 1999-2000 in Missouri. This represents 25.6% of all new male cancers and 10.3% of all cancer deaths among Missouri men.

Based on the SEER data of five states and four metropolitan areas covering 10% of the US population, the prostate cancer incidence rate has been increasing 1.6% per year during

1995-2000. The average annual incidence rate was 170.1 per 100,000 men during 1996-2000 among SEER program. In Missouri, the prostate cancer incidence rate for all men was 139.5 per 100,000 from 1996 through 2000. The national prostate cancer mortality rate from 1999-2000 was 22.8 per 100,000, while Missouri's prostate cancer mortality rate during 1999-2000 was higher at 29.6 per 100,000.

According to the 2002 Missouri Behavioral Risk Factor Surveillance System, 56.8% of Missouri men aged 50 and older had a PSA test within the past year. Fifty-six percent of Missouri men 50 years of age and older reported having a digital rectal exam in the past year.



### Prevention and Early Detection

The only well-established risk factors for prostate cancer are age, race/ethnicity, and genetic factors. More than 65% of all prostate cancer cases in Missouri are diagnosed in men



over age 65 and 93% of all deaths from prostate cancer are also among Missouri men in this age group. African-American men have the highest prostate cancer incidence rates in the world. Genetic studies indicate that strong familial disposition may be responsible for 5% to 10% of prostate cancers. Studies indicate that dietary fat may also be a risk factor suggesting that 20-25% of the incidence of prostate cancer among white and African-American men may be due to high levels of saturated fat intake.

Numerous studies implicate dietary and nutritional factors in the onset and progression of prostate cancer. Studies are underway to investigate whether anti-oxidants such as vitamins A, C, D, E, minerals like selenium, and carotenoids like lycopene can be part of chemopreventive strategies for prostate cancer.

Although the exact cause of prostate cancer is not known, use of the PSA test offers men of higher risk some opportunity to detect the disease early. Risk factors such as age, race, and family history should be discussed with a physician since these factors impact a man's decision to be screened and to seek follow-up care and treatment as needed.

## Disparities

African-American men are at a higher risk for prostate cancer than men of any other racial or ethnic background. The prostate cancer incidence rate for African-American men was 272.1 per 100,000 from 1996 through 2000 among SEER program. Prostate cancer was the leading cancer diagnosis from 1996 to 2000 among African-American men in Missouri, accounting for nearly 40% of new cancer diagnoses each year. The prostate cancer incidence rate among African-American men in Missouri was nearly 70% higher than

the rate for white men in Missouri (223.3 per 100,000 versus 132.6 per 100,000 respectively, from 1996-2000), but well below the SEER rate for African-American men.

Prostate cancer was the second leading cause of cancer mortality in African-American men in Missouri between 1999-2000; an average of 94 African-American men died of prostate cancer (64.1 per 100,000). This was slightly lower than the national prostate cancer mortality rate from 1999-2000 at 68.6 per 100,000 for African-American men. The mortality rate for African-American men in Missouri was more than two times higher than for white men (27.2 per 100,000).

Data from the 2002 Missouri Behavioral Risk Factor Surveillance System indicated that while 47.7% of men who completed less than a high school education obtained a PSA test in the past year, 60.4% of those with at least some college had a PSA in the past year. A similar trend of increasing PSA use was seen with increasing income.



**Prostate cancer accounts for 25% of cancer in men.**

## Pancreatic Cancer

### Bottom Line

The pancreas is a gland located deep in the abdomen between the stomach and the spine and is surrounded by the liver, intestine, and other organs. The pancreas makes insulin and other hormones which help control the amount of sugar in the blood. The pancreas also makes pancreatic juices, which contain enzymes that help digest food. Most pancreatic cancers begin in the ducts that carry pancreatic juices.

Cancer of the pancreas has markedly increased in incidence over the past several decades and ranks as the fourth leading cause of cancer death in the United States. Despite the high mortality rate associated with pancreatic cancer, its causes are poorly understood. This disease is rarely curable and has an overall survival rate of less than 4%.

Studies have found the following factors to increase the risk of pancreatic cancer: increasing age (most pancreatic cancer occur in persons over age 60); smoking; diabetes; male sex; race (African American); and a family history of pancreatic, colon, or ovarian cancer.

### Cancer Burden

The American Cancer Society estimates that 31,860 Americans will be diagnosed with pancreatic cancer in 2004 and 31,270 will die of this disease. Only about 21% of persons diagnosed with pancreatic cancer will survive one year following their diagnosis.

An average of 643 Missourians were diagnosed with pancreatic cancer annually during

1996-2000 for an incidence rate of 11.1 per 100,000. The incidence rate among Missouri males was slightly higher than among Missouri females (12.9 per 100,000 vs. 9.9 per 100,000). These rates were very similar to the SEER rates during this time period.

Although pancreatic cancer accounts for only 6% of cancer deaths among Missouri females and 5% among Missouri males, pancreatic cancer is the fifth leading cause of cancer death in Missouri. The mortality rate was 10.9 per 100,000, with slightly higher rates among Missouri males (12.4 per 100,000) than among females (9.4 per 100,000) during 1999-2000. National rates were very similar to those reported in Missouri.

While pancreatic cancer was the 5th leading cause of death for Missouri residents in 1999-2000, it was 4th in age-adjusted death rate, because deaths due to pancreatic cancer tends to occur at younger ages than deaths due to prostate cancer.

### Prevention and Early Detection

Since smoking has been consistently associated with increased risk of developing pancreatic cancer, discontinuing smoking is warranted. Epidemiologic studies suggest that several drugs, including aspirin, may have chemopreventive potential in pancreatic cancer.

Pancreatic cancer is difficult to detect and diagnose. Routine screening for pancreatic cancer in persons without symptoms has not been found to reduce the risk of death and is currently not recommended.

## Disparities

Pancreatic cancer is more likely to occur among African Americans than among white persons in Missouri (16.9 per 100,000 vs. 10.6 per 100,000 for 1999-2000). This disparity was also observed among the nine SEER programs.

Mortality rates for 1999-2000 were higher among African Americans in Missouri (17.0 per 100,000) compared to white Missourians (10.5 per 100,000). These rates reflect the national pattern as well.



## Hodgkin Lymphoma

### Bottom Line

Hodgkin disease, sometimes called Hodgkin lymphoma, is a cancer that starts in lymphatic tissue. Lymphatic tissue includes the lymph nodes and related organs that are part of the body's immune and blood-forming systems. The lymph nodes are small, bean-shaped organs found in many places in the body, such as the neck, underarm, groin, chest, abdomen, and pelvis.

### Cancer Burden

The American Cancer Society estimates that about 7,880 new cases of Hodgkin disease will be diagnosed in 2004 in the United States. Hodgkin disease can occur in both children and adults. It is most common, however, in two age groups: early adulthood (ages 15-39) and late adulthood (age 75 and older). Hodgkin disease is rare before 5 years of age. About 13% of cases are diagnosed in children and adolescents 19 years of age and younger.

It was estimated that 1,320 people would die of Hodgkin disease in the United States during 2004. Because of advances in treatment, death rates from Hodgkin disease have fallen nearly 1% per year since the late 1980s.

In Missouri, there was an average of 154 new cases per year during 1996-2000, producing an incidence rate of 2.8 per 100,000. This is the same as the incidence rate based on the SEER data during this time period. Mortality from Hodgkin disease is low. In Missouri, the average was 27 deaths per year from 1999-2000. The Missouri mortality rate was the same as the national mortality rate during 1999-2000 (0.5 per 100,000).

### Prevention and Early Detection

Risk factors for Hodgkin lymphoma are largely unknown, but in part involve reduced immune function, exposure to infectious agents, and age. Other possible risk factors include occupational exposures to herbicides.



## Non-Hodgkin Lymphoma

### Bottom Line

Non-Hodgkin lymphoma is cancer that starts in lymphoid tissue (also called lymphatic tissue). The lymphatic system is important for filtering bacteria and cancer cells and carrying fluid from the limbs and internal organs. Lymphoid tissue contains lymphocytes, which are cells that fight infections. They also try to reject any foreign tissue that gets into the body, such as a transplanted organ. Lymphocytes are found in lymphoid organs and in the bone marrow.

Lymphoid tissue is formed by several types of immune system cells that work together to resist infections. Lymphoid tissue is found in many places throughout the body. Lymphocytes (lymph cells) are the main cell types of the immune system. There are two types of lymphocytes: T-cells and B-cells. Although both types can develop into lymphomas, B-cell lymphomas are much more common than T-cell lymphomas. These two cell types account for 85% (B-cell) and 15% (T-cell) of cases of non-Hodgkin lymphoma.

Non-Hodgkin lymphoma can often be distinguished from Hodgkin lymphoma by examining the cancerous tissue under a microscope. In some cases, more tests to identify specific chemical components of the lymphoma cells or tests of the cells' DNA may be needed.

### Cancer Burden

About 54,370 Americans are expected to be diagnosed with non-Hodgkin lymphoma, and about 19,410 Americans are estimated to die of this cancer in 2004.

Non-Hodgkin lymphoma is the sixth most common cancer in this country, excluding nonmelanoma skin cancers. Since the early 1970s, incidence rates for non-Hodgkin lymphoma have nearly doubled. This increase appears to be due to a combination of better methods of detection as well as an actual increase in the number of new cases. During 1992-1998, incidence rates have stabilized, except among African-American females in whom incidence rates were still increasing.



In Missouri from 1996-2000, there was an average of 1,057 new cases per year of non-Hodgkin lymphoma for an incidence rate of 18.5 per 100,000. Males had a higher incidence rate (22.4 per 100,000) than females (15.5 per 100,000). Missouri's mortality rate was slightly higher than the national rate for 1999-2000 (8.7 per 100,000 vs. 8.0 per 100,000 respectively).

Although some types of non-Hodgkin lymphoma are among the most common child-



hood cancers, over 95% of non-Hodgkin lymphoma cases occur in adults. The average age at diagnosis is in the early 40s. The risk of developing non-Hodgkin lymphoma increases with increasing age to where older adults are at highest risk.

### Prevention and Early Detection

Since the causes of non-Hodgkin lymphoma are still unknown, preventing this disease is difficult. There is currently no method for early detection of non-Hodgkin lymphoma.

### Disparities

Non-Hodgkin lymphoma was more common in men than in women in Missouri during 1996-2000. Whites (18.8 per 100,000) are affected more often than African Americans (13.0 per 100,000) in Missouri. The geographic variation in incidence and mortality rates of non-Hodgkin lymphoma across Missouri is small.



**"I often tell those who are angry about cancer, that, yes, these feelings are normal, and I understand why you feel this way. HOWEVER you can not let cancer envelop you."  
A Cancer Survivor**

## Leukemia

### Bottom Line

Leukemia constitutes less than 5% of cancers in the United States but includes a wide range of biologically and clinically distinct subtypes. Despite extensive epidemiologic study, the prospect for prevention of leukemia is limited because its causes are largely unknown.

Leukemia is more common in males than in females. Farmers and workers exposed to

benzene, ionizing radiation, and hair dyes are at increased risk of developing leukemia. The risk of leukemia is also elevated among smokers, those exposed to specific viruses, and among first-degree relatives (parents, siblings, or children) of chronic leukemia patients. Leukemia may also occur as a side effect of cancer treatment. The risk of leukemia among cancer patients, although higher than that in the general population, is still extremely low.

## Cancer Burden

Overall, about 33,440 new cases of leukemia are expected in the United States during 2004, according to the American Cancer Society, and approximately half will be acute leukemia and half will be chronic leukemia. An estimated 23,300 adults and children in the United States will die of leukemia during 2004.

From 1996-2000, there was an average of 683 new cases of leukemia diagnosed each year in Missouri. The incidence of leukemia was higher among males (15.7 per 100,000) than among females (9.3 per 100,000) in Missouri. Overall, annual incidence rates in Missouri during 1996-2000 were similar to the SEER program rates for both men and women. The 1999-2000 mortality rate for

leukemia in Missouri was very close to the national rate (7.9 per 100,000 and 7.7 per 100,000, respectively).

## Prevention and Early Detection

There are currently no tests to detect leukemia in an early, more treatable stage. Early symptoms of leukemia such as fatigue, weight loss, and swelling of the lymph nodes, are often not defined enough to generate a diagnosis of leukemia. These symptoms often resemble those of other, less serious conditions, which makes leukemia difficult to detect and treat early. Patients should consult their physician if undiagnosed chronic symptoms linger, especially if there is a history of leukemia in the family.

## Types of Leukemia



mon adult leukemia is acute myelogenous leukemia (AML) with approximately 11,920 new cases expected nationally in 2004. About 10,320 deaths from acute leukemias will occur in the United States during 2004. AML is a disease of mostly older people; the average age of a patient with AML is 65 years. The chance of developing leukemia for a 50-year-old person is 1 in 50,000; for a 70-year-old, it is 1 in 7,000. AML is more common among men than among women. An estimated 20% of adult acute leukemia cases are related to smoking tobacco. Smoking doubles the risk of AML in people over 60.

### Adult Acute

In acute leukemias, the bone marrow cells are unable to mature properly. The most com-

### Adult Chronic

In chronic leukemias, bone marrow cells can mature but are not completely normal and do not fight infections as well as normal white

blood cells do. Approximately 12,790 new cases of chronic leukemia are expected during 2004 nationally. The two main types of chronic leukemia are chronic lymphocytic leukemia (CLL) and chronic myelogenous leukemia (CML). If the cancer develops from bone marrow lymphocytes, it is called lymphocytic leukemia. If the cancer develops from precursors to myeloid tissues (red blood cells), it is called myelogenous leukemia. Nationally, approximately 8,190 new cases of CLL and 4,600 new cases of CML are expected in 2004. The average age of patients with CLL is about 70 years of age. The average age of patients with CML is 40 to 50 years of age. About 98% of chronic leukemia patients are adults. During 1996-2000, an average of 69 Missourians were diagnosed with CML and 157 Missourians were diagnosed with CLL every year.



## Childhood

Leukemia is the most common cancer in children and adolescents. It accounts for 31% of all cancers in children under age 15 and 25% of cancers occurring before age 20 in Missouri. Leukemia accounted for 28% of new cancer cases during 1996-2000 and 37%

of cancer deaths among Missouri children ages 0-14 from 1999-2000.

The American Cancer Society predicts that about 2,860 children will be diagnosed with leukemia in the United States during the year 2004. Of those 2,860, about 78% will be diagnosed with Acute Lymphocytic Leukemia (ALL). Many of the remaining children will be diagnosed with AML. ALL is most common in early childhood, peaking between two and three years of age. In Missouri during 1996-2000, an average of 34 children 0-14 years of age was diagnosed with ALL each year, which accounts for 88% of children diagnosed with leukemia for this age group.

AML is most common during the first two years of life. AML incidence rises again during the teenage years. AML is the most common acute leukemia in adults over 55 years of age. AML or ALL can be kept in remission for a long time or cured in about 20% to 30% of adults. Each year during 1996-2000, an average of 176 Missourians were diagnosed with AML.

## Disparities

Childhood and adult ALL rates are consistently higher among males than females in each age group, except among persons under age 20. ALL is slightly more common among white children than among African-American and Asian-American children. Rates for CLL are lower in females. Age-adjusted AML rates are higher in metropolitan areas compared to rural areas. CML rates are higher in African American than in white persons in the United States.

**Leukemia is the most common cancer in children and adolescents.**



## Ovarian Cancer

### Bottom line

The ovaries are a pair of organs in the female reproductive system functioning to produce eggs and hormones. Ovarian cancer is the most common cause of death from gynecological cancer in the United States. The lifetime risk of ovarian cancer is about 1.8%. Cancer of the ovary accounts for about 4% of all cancers among Missouri women every year. Nearly 300 Missouri women die every year from this disease.



**The sooner ovarian cancer is found and treated, the better a woman's chance for recovery. Unfortunately, ovarian cancer is difficult to detect early. The exact causes of ovarian cancer are not known.**

The exact causes of ovarian cancer are not known. Studies show that the following factors may increase the risk of developing this disease: a family history of ovarian, breast, or colon cancer; older age; never having had children; personal history of breast or colon cancer; and use of talc in the genital area. The lifetime risk of ovarian cancer among women with specific genes (BRCA 1 and BRCA 2) is estimated to range between 16% and 30%. Some studies have suggested that the use of fertility drugs and hormone replacement therapy increase the risk of ovarian cancer.

### Cancer Burden

The American Cancer Society estimates that 25,580 women will be diagnosed with ovarian cancer in the United States in 2004 and 16,090 will die of this disease. In Missouri, an average of 489 women was diagnosed with cancer of the ovaries annually during 1996-2000, an incidence rate of 15.7 per 100,000. The Missouri rate of ovarian cancer was the same as the SEER rate.

An average of 288 Missouri women died of ovarian cancer for a mortality rate of 8.6 per 100,000 during 1999-2000. This was similar to the national mortality rate (8.1 per 100,000 women).

### Prevention and Early Detection

The options for preventing ovarian cancer are very limited. To date, only the use of oral contraceptives has been shown to be effective as a chemopreventive agent to reduce the risk of ovarian cancer.



The sooner ovarian cancer is found and treated, the better a woman's chance for recovery. Unfortunately, ovarian cancer is difficult to detect early. Scientists are exploring the usefulness of measuring the level of CA 125, a substance called a tumor marker, which is often found in higher-than-normal amounts in the blood of women with ovarian cancer. They are also evaluating transvaginal ultrasound, a test that may help detect the disease early. Currently, there is insufficient evidence to recommend for or against the screening of asymptomatic women at increased risk of developing ovarian cancer.

There is almost a 95% 5-year relative survival rate if ovarian cancer is detected at local stage – that is while still confined to the ovary.

### Disparities

Ovarian cancer is more common in white women (16.2 per 100,000) than among African-American women (11.8 per 100,000) in Missouri. White women in Missouri are also slightly more likely to die from ovarian cancer once diagnosed than their African-American counterparts (8.8 per 100,000 vs. 7.2 per 100,000, respectively).

## Bladder Cancer



among men and 28% among women. Increased risks are also associated with certain occupational exposures, such as dye, rubber, or chemicals used in the leather industry. About 13% of bladder cancer is attributable to occupational exposures.

### Cancer Burden

In Missouri, an average of 861 males (36.0 per 100,000) and 295 females (8.7 per 100,000) was diagnosed with bladder cancer annually during 1996-2000. These rates for both males and females were very similar to those reported by the nine SEER programs. The incidence has been increasing over the past two decades at a rate of about 1% per year in the SEER program.

An average of 213 deaths each year was due to bladder cancer during 1999-2000 in Missouri (154 males and 60 females). This represents 1.8% of all cancer deaths among Missourians. The average Missouri mortality

### Bottom Line

Bladder cancer is the most common cancer of the urinary tract, accounting for an estimated 60,240 new cases nationally in 2004. Cigarette smoking is a well-established risk factor for bladder cancer. Smoking is estimated to account for 48% of bladder cancers

rate during 1999-2000 was slightly lower than the national mortality rate (3.6 per 100,000 vs. 4.3 per 100,000).

### Prevention and Early Detection

Prevention of bladder cancer should focus on eliminating cigarette smoking and minimizing exposure to hazardous chemicals in the work place.

Currently, no routine screening test is available for early detection of bladder cancer.

**"Having cancer is bad enough!  
Not knowing what to do about  
it is even worse." R.A. Bloch**

### Disparities

In Missouri, white persons were nearly twice as likely to develop bladder cancer as African Americans (20.6 per 100,000 vs. 11.4 per 100,000, respectively). However, the difference in mortality rate between the two groups was not as large.

The largest difference in incidence of bladder cancer in both Missouri and among the nine SEER programs was between males and females. The incidence rate during 1996-2000 was 36.0 per 100,000 for males and 8.7 per 100,000 for females in Missouri. The mortality rate for males (6.6 per 100,000) was also four times higher than among females (1.6 per 100,000) in Missouri.

The geographic variation in mortality rates of bladder cancer across Missouri was small.

## Multiple Myeloma

### Bottom Line

The immune system is composed of several types of cells that work together to fight infections and other diseases. Lymphocytes (lymph cells) are the main cell type of the immune system. There are two types of lymphocytes: T-cells and B-cells. When B-cells respond to an infection, they mature and change into plasma cells. When plasma cells grow out of control they can produce a tumor (myeloma). These tumors can grow in several sites, particularly

in the soft middle parts of bone called the bone marrow. When these tumors grow in multiple sites they are called multiple myeloma.

### Cancer Burden

It is estimated that about 15,270 new cases of multiple myeloma will be diagnosed nationally during 2004, according to the American Cancer Society. About 11,070 Americans are expected to die of multiple myeloma in 2004.

**Certain chemicals in the environment are known to cause cancer.  
These include tobacco smoke, secondhand smoke, and radon in the home.**

An annual average of 283 new cases of multiple myeloma was diagnosed among Missourians during 1996 to 2000. The rate among men (5.9 per 100,000) was higher than among women (4.2 per 100,000). During 1999-2000, an average of 206 Missourians died from multiple myeloma for an average annual mortality rate of 3.6 per 100,000, which was similar to the national rate for the same time period (3.9 per 100,000).

### Prevention and Early Detection

Scientists have identified a few risk factors that make a person more likely to develop multiple myeloma. Age is the most significant risk factor since only 2% of cases are diagnosed in people younger than 40. The average age at diagnosis is 70. People with other plasma cell diseases may also be at higher risk.

Exposure to radioactivity has been suggested as a risk factor but accounts for a very small number of cases. Some studies have suggested that workers in certain petroleum-related industries and farmers may be at higher risk. Finally, this cancer may seem to be more common in some families, suggesting genetic or common environmental influences.

There are currently no methods available to detect multiple myeloma in an early, more treatable stage.

### Disparities

Multiple myeloma is twice as common among African Americans as among whites. The reason for this is not known.



**In the earliest stage of multiple myeloma, there may be no symptoms. When symptoms do occur, patients commonly have bone pain, often in the back or ribs. Patients also may have broken bones, weakness, fatigue, weight loss, or repeated infections. When the disease is advanced, symptoms may include nausea, vomiting, constipation, problems with urination, and weakness or numbness in the legs. These are not sure signs of multiple myeloma; they can be symptoms of other types of medical problems. A person should see a doctor if these symptoms occur. Only a doctor can determine the correct cause.**



## Melanoma of the Skin

### Bottom Line

Nearly all skin cancers are preventable by limiting unprotected exposure to the sun. When they do occur, most skin cancers can be treated successfully if detected early – even melanoma, the most serious type of skin cancer.

The vast majority of skin cancers are due to unprotected and excessive ultraviolet (UV) radiation exposure. The American Cancer Society estimates that more than one million cases of basal cell and squamous cell cancers are associated with UV exposure annually in the United States. Most exposure to ultraviolet radiation comes from sunlight, but exposure can also come from artificial sources, such as tanning booths. While the short-term results from unprotected UV exposure are tanning and sunburn, long-term exposure can cause prematurely aged skin, wrinkles, and skin cancer. Ultraviolet (UV) exposure is associated with a small percentage of all cancer deaths.

### Cancer Burden

Nationally, approximately 55,100 new cases of melanoma are expected to be diagnosed in 2004 in the United States. An average of 554 Missourians was diagnosed with malignant melanoma every year during 1996-2000. The melanoma incidence rate in Missouri from 1996-2000 was 9.8 per 100,000. One hundred sixty-five Missourians died annually from malignant melanoma between 1999 and 2000. Sixty-seven percent of the deaths occurred in men, and 33% of the deaths occurred in women. Missouri's annual mortality rate during 1999-2000 (2.9 per 100,000) was very similar to the national rate



of 2.7 per 100,000. Since it is not a national requirement to report non-melanoma skin cancers, the full extent of these skin cancers is unknown.

Sunburn during childhood and intense intermittent sun exposure increase the risk of melanoma and other skin cancers. According to the 1999 Behavioral Risk Factor Surveillance System, 34.5% of adults 18 years of age or older reported that they had at least one sunburn during the past year in the United States (males: 39.7%, females: 28.8%). In Missouri, 44.1% of males and 32.4% of females reported being sunburned during the 12 months preceding the survey in 1999.

### Prevention and Early Detection

Risk factors for melanoma include: light-skin color; a personal or family history of melanoma; presence of moles and freckles; and a history of excessive sun exposure,



including severe sunburn occurring early in life. Risk factors for basal and squamous cell cancers include: chronic exposure to the sun; a personal or family history of skin cancer; and light-skin color.

The American Cancer Society recommends the following to prevent skin cancer:

- Avoid direct exposure to the sun between the hours of 10 a.m. and 4 p.m., when the ultraviolet rays are the most intense.
- Cover as much skin as possible when outdoors: wear a hat that shades the face, neck, and ears, a long sleeved shirt, and long pants.
- Wear sunglasses to protect the eyes.
- Cover exposed skin with a sunscreen with a sun protection factor (SPF) of 15 or higher.
- Avoid tanning beds and sun lamps, which provide an additional source of UV radiation.

Since most lifetime sunlight exposure occurs during childhood or adolescence, sun protection behaviors should begin at a young age.

A study by the Centers for Disease Control and Prevention revealed that three-fourths of parents with children aged 12 or younger used one or more sun protective behaviors, with sunscreen use the most frequently reported. An American Cancer Society study showed that less than one-third of adolescents practiced any sun protection behavior.

Recognition of changes in skin growths or the appearance of new growths is the best way to identify early skin cancer. The American Cancer Society recommends that adults should practice skin self-examination regularly. Melanomas often start as small, mole-like growths that increase in size and

change color. Suspicious lesions should be evaluated promptly by a physician.

Chemoprevention, the use of natural or synthetic agents to reverse, suppress, or prevent premalignant molecular or histologic lesions from progressing to invasive cancer, is starting to be investigated in melanoma. Epidemiologic studies have supported a protective effect of drinking green tea against skin cancer. Other nutritional factors are starting to be examined in scientific studies.

## Disparities

Nationally, melanoma rates are more than ten times higher in whites than in African Americans. Persons with darker skin can also develop this cancer, especially on the hands, soles of the feet, and under the nails. Variations by race, ethnicity, and gender were observed in results from the Behavioral Risk Factor Surveillance System, with a higher percentage of sunburns among white, non-Hispanic males (43.4%) and females (32.0%) and lower percentages among black, non-Hispanic males (5.6%) and females (5.2%).



## Cancer of the Oral Cavity and Pharynx

### Bottom Line

Cancers of the oral cavity (lip, salivary gland, mouth, and throat) are estimated at 28,260 new cases and 7,230 deaths in the U.S. in 2004. Two known causes of oral cancer are tobacco and alcohol use.

- Tobacco use – smoking cigarettes, cigars, or pipes; chewing tobacco; or dipping snuff – accounts for 80 to 90 percent of oral cancers. A number of studies have shown that cigar and pipe smokers have the same risk as cigarette smokers. Studies indicate that snuff or chewing tobacco users are at particularly high risk of developing oral cancer. For long-time users, the risk is much greater, making the use of snuff or chewing tobacco among young people a special concern.
- Chronic and/or heavy use of alcohol also increases the risk of oral cancer, even for people who do not use tobacco. However, people who use both alcohol and tobacco have an especially high risk of oral cancer. Scientists believe that these substances increase each other's harmful effects.

### Cancer Burden

In Missouri, an average of 586 new cases of oral cancer was diagnosed every year during 1996-2000 (10.4 per 100,000). This is very similar to the SEER incidence rate for oral cancer.

An average of 141 Missourians died every year during 1999-2000 from oral and pharyngeal cancer (2.4 per 100,000). This is the same as the national mortality rate for oral and pharyngeal cancer.

### Prevention and Early Detection

Oral and pharyngeal cancers are largely preventable. Oral cancer deaths could be reduced significantly by eliminating smoking and smokeless tobacco and by reducing heavy alcohol consumption.

Although there is insufficient evidence to recommend for or against routine screening of asymptomatic persons for oral cancer by primary care physicians, clinicians should remain alert to signs and symptoms of oral cancer and premalignancy in persons who use tobacco or regularly use alcohol.

### Disparities

Oral and pharyngeal cancer mortality rates are two times higher among men (3.3 per 100,000) in Missouri than among women (1.7 per 100,000) and almost two times higher among African Americans (4.0 per 100,000) than among whites (2.3 per 100,000).



## Cervical Cancer

### Bottom Line

Screening by means of the Pap test offers a powerful method for the prevention and early detection of cervical cancer. The use of the Pap test on a regular basis reduces the risk of death from cervical cancer by 90%, mainly through the detection and treatment of pre-invasive lesions. Cervical cancer incidence and mortality rates have decreased markedly in the past several decades, with most of the reduction attributed to the introduction of the Pap test.



### Cancer Burden

In an average year, 304 Missouri women will develop invasive cervical cancer and 89 women will die of the disease. The incidence rate of cervical cancer in Missouri during 1996-2000 was 10.4 per 100,000. The mortality rate from cervical cancer among Missouri women from 1999-2000 was 2.8 per 100,000 women, the same as the national rate.

### Prevention and Early Detection

Cervical cancer risk is closely linked to sexual behavior and to sexually transmitted infections with certain types of human papilloma virus (HPV), a virus that can promote the development of cancer. Women who have sex at an early age (before age 18), have many sexual partners, or partners who have had many sexual partners are at increased risk of developing the disease. Condoms may provide some protection from HPV. Cigarette smoking increases the cervical cancer risk, especially in conjunction with the use of oral contraceptives. A concern is the increase of smoking among younger women during the 1980s, which may translate into more cervical cancers among this population in the future.

Pap tests can detect precancerous cells, allowing these problems to be treated before cervical cancer develops. Invasive cervical cancer and related mortality have decreased significantly over the past 25 years because of increased screening with Pap tests and prompt treatment once diagnosed. In Missouri in 2002, 84.0% of women reported having a Pap smear in the past three years.

### Disparities

Pap test utilization in Missouri differs by many demographic factors, including education, income, race, and having health insurance. Eighty-eight percent of Missouri women with more than a high school education reported that they had a Pap test in the previous three years compared to 73.4% of women without a high school education based on 1999-2000 BRFSS data. There is a 15%



difference in the use of Pap tests between women with household incomes of at least \$50,000 (92.4%) relative to those with household incomes of less than \$25,000 (77.6%). Women with health insurance were more likely to report that they had a Pap smear within the past three years (86.3%) than women without insurance (72.8%). African-American women (91.7%) were more likely to have a Pap test within the previous three years than white women (84.2%).

Screening for cervical cancer varies somewhat throughout Missouri, but is generally high. Using the 2003 Missouri county-level survey, nearly all of women age 18-69 in St. Charles, Warren, and Lincoln counties have had a pap smear. While 13% of women age 18-69 in Oregon and Howell counties reported to have not had a Pap smear.

Geographic differences are seen in incidence of cervical cancer throughout Missouri. Higher incidence rates more likely reflect reduced use of Pap tests or infrequent screenings locally. The incidence of cervical cancer ranged from a low of 5.6 per 100,000 among women from St. Charles County to a high of 16.7 per 100,000 among women in the City of St. Louis during 1996-2000.

The incidence rate of cervical cancer in African-American women in Missouri from 1996-2000 (15.7 per 100,000) is nearly double the rate for white women (9.8 per 100,000). Mortality rates among African-American women during 1999-2000 (5.7 per 100,000) in Missouri are more than two times higher than among white women (2.5 per 100,000). Mortality rates for African-American and white women in Missouri are very similar to the national mortality rates of 5.4 per 100,000 and 2.5 per 100,000 for African-American and white women.

**The use of screening tests to detect cancers early often leads to more effective treatment with fewer side effects. Patients whose cancers are found early also are more likely to survive those cancers than are patients whose cancers are not found until symptoms appear.**

- **Mammography / Clinical Breast Examination**

(for breast cancer)

- **Pap smear**

(for cervical cancer)

- **Fecal occult blood test**

(for colorectal cancer)

- **Colorectal endoscopy**

(sigmoidoscopy or colonoscopy for colorectal cancer)





## Survivorship



A vital component of comprehensive cancer planning identified by the Centers for Disease Control and Prevention and also recognized by the National Cancer Institute is the growing cancer survivor population. Among SEER programs, the overall 5-year survival rate for all cancers combined among adults is 62%, and the overall 5-year survival rate for children with cancer is 77%. While three out of every four Missouri families will be affected by cancer, the mortality rate of all cancers combined has been declining since 1990, and the proportion of patients alive five years after diagnosis has been increasing since 1975. The National Cancer Institute states, "An individual is considered a cancer survivor from the time of diagnosis, through the balance of his or her life." Family members, friends, and caregivers are also impacted by the survivorship experience.

As of January 2000, there were an estimated 9.4 million cancer survivors nationally (about 3% of the population).

Key to addressing the needs of survivors is gaining understanding of their unique needs and concerns during the time following diagnosis. These needs and concerns span the physical, psychological, social, emotional and spiritual domains. Examples of survivor issues include concerns regarding quality of life, late-term and long-term effects of cancer treatment, re-employability and insurability, and fear of recurrence.

The Missouri Cancer Consortium will work to address the needs of the growing survivor population through activities that span the cancer control continuum, including palliation and quality of life. It will take a concerted effort to obtain better and more accurate data to describe the needs of survivors and to develop the means to appropriately and adequately address those needs.

**The American Cancer Society estimated that in 2003, more than 180,000 cancer deaths were attributed to tobacco use. The American Cancer Society has adopted 2015 Nationwide Objectives to reduce the proportion of adults (age 18 and older) who use tobacco products to 12% and to reduce the proportion of youths (under age 18) who use tobacco products to 10%.**

## Cancer Disparities

The burden of cancer is not borne equally by all population groups in Missouri. The unequal burden is exemplified by differences in cancer incidence and mortality as a function of race, ethnicity, gender and socioeconomic status. Eliminating health disparities is a key goal of the Missouri cancer control plan as well as national organizations and agencies including the American Cancer Society and the U.S. Department of Health and Human Services Healthy People 2010 initiative. Despite research demonstrating the existence of health disparities, there is strikingly little known about the causes of these disparities and how to prevent them. Poor and medically underserved populations have higher risks of developing cancer and poorer chances of early diagnosis, optimal treatment, and survival. Moreover, these populations have not benefited equally from recent improvements in cancer prevention, early detection, and treatment.

### Racial Disparities

Racial disparities have been described in detail for each of the cancers previously reported. Here, these disparities are briefly summarized.

In Missouri, African Americans are more likely to develop various cancers, including lung, colorectal, prostate, pancreatic, multiple myeloma, oral and cervical cancer, than white Missourians. African Americans are also more likely to die from lung, colorectal, breast, multiple myeloma, prostate, pancreatic, oral and cervical cancer. For some cancers, namely Non-Hodgkin lymphoma, ovarian, bladder and malignant melanoma, African Americans were at lower risk than white Missourians.



The elevated mortality rate for cancers such as colorectal and cervical cancer among African Americans is partly due to low utilization of effective screening tests. For breast cancer, on the other hand, African-American women are equally likely to be screened and their elevated mortality rate relative to white women may be due to other factors, such as lower use of appropriate diagnostic follow-up and effective treatment.

### Socioeconomic Disparities

An apparent overriding factor is socioeconomic status (SES), which is closely tied to health status. People with higher SES have better health than those at the level below them. SES also appears to be a strong force behind differences in health among racial and ethnic groups. According to the Centers for Disease Control and Prevention, African Americans, Hispanics, Native Americans, and Asian populations such as Vietnamese and Laotians are more likely than other groups to

be poor. Poverty affects health outcomes in part by limiting access to needed resources. Other factors of SES such as education, geographic location, and occupation also affect health. Often poorer neighborhoods are "economically segregated." This means that there may be a limited number of healthcare facilities available, and there may be transportation problems in accessing the facilities.

Despite the fact that many cancers can be prevented by taking advantage of current knowledge, minority and disadvantaged groups are less likely to benefit from knowledge about cancer prevention and early detection for a variety of reasons. Lower educational attainment and poverty translate into reduced opportunities in many ways beyond just a lack of knowledge. For example, low-income communities are less likely to have access to healthy foods and facilities for recreational physical activity than more affluent



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communities. Knowledge about the causes of cancer is merely the beginning of the prevention process. This knowledge needs to be translated into practice. Effective cancer prevention, early detection, appropriate treatment, and good quality of life following diagnosis requires actions at various levels, including community groups, health care providers, educators, employers, and the individuals affected.

Although documenting socioeconomic disparities in cancer is clearly important in order to target specific population subgroups and thereby reducing disparities, educational attainment, occupation, and income are not routinely available on cancer patients in Missouri. As an alternative, the county poverty rate (the percentage of population below the poverty level) is a measure of economic deprivation and uneven distribution of economic resources in a county population. It has been successfully used to describe socioeconomic disparities at the national level. The following cut-points for county poverty rate were selected: <10%, 10%-19.9%, ≥20%. Counties with a poverty rate of 20% or higher are often considered to be distressed or severely disadvantaged counties.

Differences in lung cancer incidence and mortality rates were seen when comparing counties with different poverty rates. During 1996-2000, there was little difference in the incidence rates for counties with poverty rates less than 10% (61.3 per 100,000) and those with poverty rates 10-19.9% (64.8 per 100,000). However, among counties where at least 20 percent of the population lived below poverty, the incidence rate was substantially higher at 75.8 per 100,000 population.

For breast cancer, the incidence rate is highest for counties with less than 10% of their population below poverty (130.7 per 100,000) and lowest for counties with more than 20%



of their population below poverty (117.5 per 100,000). This may be due to the increased use of screening for breast cancer among women in counties with a low poverty rate. In contrast, the mortality rates were similar among counties with low, medium and high poverty rates.

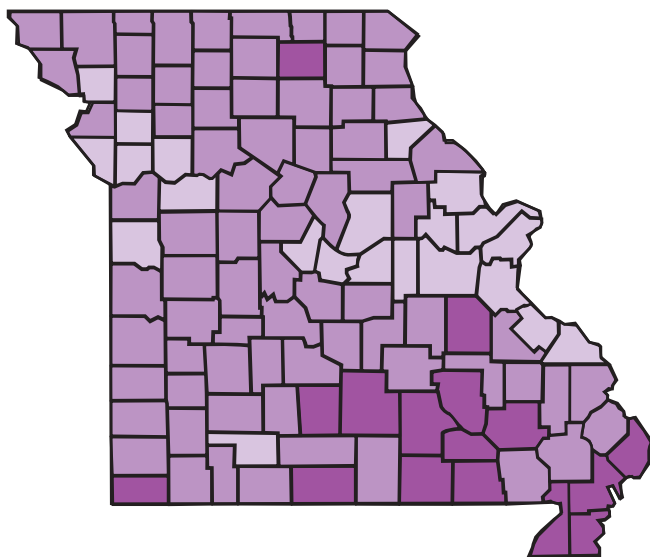
The annual average prostate cancer incidence rates were similar across county poverty rates. However, the annual average mortality rate due to prostate cancer was 23% higher among counties with poverty rates of 20% or more (33.1 per 100,000) than among counties with poverty rates that were less than 10% (26.8 per 100,000).

The incidence rate of cervical cancer was higher during 1996-2000 in counties with

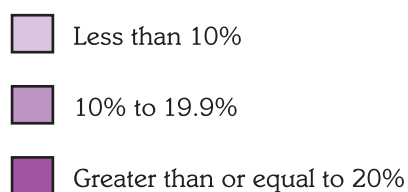
higher poverty rates. Among counties with poverty rates less than 10%, the incidence rate was 7.5 per 100,000 population. However, the incidence rate was 15.0 per 100,000 among counties where at least 20 percent of the population had incomes less than federal poverty guidelines. The higher incidence rates among counties with high poverty rates may likely be the result of underutilization of Pap tests among women who reside in these counties. The mortality rates from cervical cancer also increased with increasing county poverty rates. Rates were highest in counties where at least 20% of the population had incomes below poverty standard (3.6 per 100,000) and lowest among counties with poverty rates less than 10% (2.2 per 100,000).

Incidence and mortality rates did not vary significantly by county poverty rate for non-Hodgkin lymphoma, leukemia, and colorectal, pancreatic, ovarian and bladder cancer.

### Poverty Rate by County



Colors indicate percent of the population below federal poverty level in that county.



\*2000 data from the U.S. Bureau of the Census.

### Disparities by Gender

In Missouri and the United States, the cancer burden varies by gender. Men are at least two times more likely to develop and die from bladder, lung, and oral cancers than women. Other cancers for which men are at increased risk include pancreatic cancer, non-Hodgkin lymphoma, and leukemia.

### Interventions

Addressing disparities requires a multifaceted approach because the underlying factors producing disparities are complex. Disparate health outcomes are not primarily due only to one microbe or genetic factor. Instead, a broad range of social, economic and community conditions interplay with such individual factors to intensify susceptibility, provide less



protection, and affect healthy behaviors. These conditions, such as deteriorated housing, poor education, limited employment opportunities, limited household resources, readily available cheap high-fat foods, and limited access to parks and recreational facilities are particularly exacerbated in neighborhoods where people of color and low-income live.

Research has now shown that, after adjusting for individual risk factors, there are neighborhood differences in cancer screening, incidence, treatment, and survival. It is the relationship between place, race, and poverty that

can lead to the greatest disparities. Reducing such disparities requires action at several levels to maximize impact.

The Missouri Cancer Consortium is committed to working with researchers, healthcare professionals, community organizations, and others to better determine the causes of health disparities, to determine the needs of our aging population, and to develop interventions to address these issues across the cancer care continuum ranging from prevention, early detection, diagnosis, treatment, survival, quality of life, and end-of-life care.

### Websites for Information on Cancer Related Topics

|                                 |  |
|---------------------------------|--|
| Biology of Cancer / Treatments  | <a href="http://www.cancerquest.emory.edu">www.cancerquest.emory.edu</a>   |
| Cancer (General)                | <a href="http://www.cdc.gov/cancer">www.cdc.gov/cancer</a><br><a href="http://www.cancer.gov">www.cancer.gov</a><br><a href="http://cis.nci.nih.gov">http://cis.nci.nih.gov</a><br><a href="http://www.cchangetogether.org">www.cchangetogether.org</a><br><a href="http://www.dhss.mo.gov">www.dhss.mo.gov</a><br><a href="http://www.blochcancer.org">www.blochcancer.org</a><br><a href="http://www.asco.org">www.asco.org</a><br><a href="http://www.siteman.wustl.edu">www.siteman.wustl.edu</a><br><a href="http://www.thecommunityguide.org">www.thecommunityguide.org</a><br><a href="http://kccancer.info">http://kccancer.info</a> |
| Clinical Trials                 | <a href="http://www.trialcheck.org">www.trialcheck.org</a><br><a href="http://www.kcancer.com">www.kcancer.com</a>   |
| Evidence-based Program Planning | <a href="http://www.cancercontrolplanet.cancer.gov">www.cancercontrolplanet.cancer.gov</a>   |
| Non-smokers' Rights, Cessation  | <a href="http://www.no-smoke.org">www.no-smoke.org</a><br><a href="http://www.ttac.org">www.ttac.org</a>   |
| Palliative Care                 | <a href="http://www.acponline.org/public/h_care/contents.htm">www.acponline.org/public/h_care/contents.htm</a><br><a href="http://www.nationalconsensusproject.org/guidelines.html">www.nationalconsensusproject.org/guidelines.html</a>   |
| Radon                           | <a href="http://www.dhss.mo.gov/ehcdp/SEPH.htm">www.dhss.mo.gov/ehcdp/SEPH.htm</a>   |
| Secondhand Smoke                | <a href="http://www.epa.gov/iaq/pubs/etsbro.html">www.epa.gov/iaq/pubs/etsbro.html</a><br><a href="http://www.lungusa.org/tobacco/secondhand_factsheet99.html">www.lungusa.org/tobacco/secondhand_factsheet99.html</a><br><a href="http://www.smokingorhealth.org/index.php">www.smokingorhealth.org/index.php</a><br><a href="http://www.smokelessstates.org">www.smokelessstates.org</a><br><a href="http://www.uicc.org">www.uicc.org</a>   |
| Cancer Statistics               | <a href="http://www.cdc.gov/cancer/npcr/uscs/2000/index.htm">www.cdc.gov/cancer/npcr/uscs/2000/index.htm</a><br><a href="http://www.dhss.mo.gov">www.dhss.mo.gov</a><br><a href="http://www.cancer.org">www.cancer.org</a><br><a href="http://www.mhanet.com">www.mhanet.com</a>   |
| Tobacco                         | <a href="http://www.ttac.org">www.ttac.org</a><br><a href="http://www.dhss.mo.gov/smokingandtobacco">www.dhss.mo.gov/smokingandtobacco</a>   |

## Sources of Statistics

### Cancer Deaths and Death Rates

Data on the number of deaths nationally were obtained from the National Center for Health Statistics (NCHS) at the Centers for Disease Control and Prevention. The American Cancer Society calculated the numbers of U.S. cancer deaths expected to occur in 2004 by fitting the numbers of cancer deaths for 1969 through 2001 to a statistical model.

The cancer deaths for Missouri and its counties were obtained from the Missouri Department of Health and Senior Services (DHSS). Most of the counts were compiled by the Missouri Cancer Registry (MCR) from files provided by the Center for Health Information Management and Evaluation (CHIME). Some counts and rates were obtained from the Missouri Information for Community Assessment (MICA) system maintained by CHIME on the DHSS web site ([www.dhss.mo.gov](http://www.dhss.mo.gov)) under "Data." MICA is an interactive system that allows anyone to create custom tables of data on various topics including deaths and new cancer cases. Tables can reflect age, race, sex, and place of residence.

MCR and MICA counts can differ slightly from each other for two reasons: 1) MCR includes deaths which are reported after the cut-off date for the annual file used for MICA, and 2) MCR and MICA use slightly different criteria for some groups of cancers, including lung/bronchus/trachea and colon/rectum/anus. MCR uses criteria from the National Cancer Institute/SEER. MICA's come from NCHS.

The years 1999-2000 were used in order to make comparisons with the most recent national mortality data, while not using data prior to the 1999 revision of the International Classification of Diseases.

Mortality rates (death rates) are defined as the number of people per 100,000 dying of a disease during a time period. Missouri cancer death rates in this publication are based on counts of cancer deaths described above and population data from the U.S. Census Bureau. Mortality rates in this publication are age-adjusted to the 2000 U.S. standard population to allow comparisons across populations with different age distributions. These rates should only be compared to other statistics that are age-adjusted to the U.S. 2000 standard population.

### New Cancer Cases

The estimated number of new U.S. cancer cases is calculated by the American Cancer Society by estimating the numbers of cancer cases that occurred each year from 1979 through 2000 and fitting these estimates to a statistical model which forecasts the number of cases that are expected to occur in 2004. The estimated number of cases for 1979 through 2000 is calculated using cancer incidence rates from states and cities of the United States included in the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) program and population data collected by the U.S. Census Bureau. The SEER program is a collection of cancer registries covering about ten percent of the U.S. population, including Connecticut, Hawaii, Iowa, Utah, and New Mexico as well as the metropolitan areas of San Francisco, Detroit, Atlanta and Seattle-Puget Sound.

The numbers of new Missouri cancer cases are obtained from the Missouri Cancer Registry from 1996 through 2000. The Missouri Cancer Registry is a collaboration between the Missouri Department of Health and Senior Services and the University of Missouri – Columbia.

## Incidence Rates

Incidence rates are defined as the number of people per 100,000 who are diagnosed with cancer during a given time period. For this publication, incidence rates were calculated using data on cancer cases collected by the SEER program and the Missouri Cancer Registry with population data collected by the U.S. Census Bureau. Incidence rates in this publication are age-adjusted to the 2000 U.S. standard population to allow comparisons across populations with different age distributions. These rates should only be compared to other statistics that are age-adjusted to the U.S. 2000 standard population.

## Behavioral Risk Factor Surveillance System (BRFSS)

The Behavioral Risk Factor Surveillance System (BRFSS) is an ongoing telephone survey conducted by all state health departments, the District of Columbia, Puerto Rico, the Virgin Islands, and Guam with assistance from the Centers for Disease Control and Prevention. The BRFSS is the largest continuously conducted telephone health survey in the world.

States use BRFSS data to track critical health problems and to develop and evaluate public health programs. The BRFSS is the primary source of information on the health-related behaviors of adults in this country. States use standard procedures to collect data through monthly telephone interviews with non-institutionalized adults 18 years or older. BRFSS interviewers ask questions related to behaviors that are associated with preventable chronic diseases, injuries, and infectious diseases. During 2001-2002, the Missouri BRFSS interviewed 8,908 Missourians regarding their behaviors, including 494 African Americans and 8,005 white persons.

## County-level Survey

This 2003 survey conducted by the Missouri Department of Health and Senior Services used standard Behavioral Risk Factor Surveillance System methods and techniques to interview via telephone 15,000 Missourians in 114 counties and the City of St. Louis. The questionnaire contained questions from the BRFSS and the Adult Tobacco Survey as well as a few state-added questions.

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# The BURDEN of CANCER in MISSOURI

The Missouri Department of Health and Senior Services Comprehensive Cancer Control program, in collaboration with the Missouri Cancer Consortium, is committed to decrease the number of new cases of cancer, to increase the survivorship of cancer patients, and to better inform all citizens about the reality of cancer.



**Three out of four Missouri families are affected by cancer. Risks may be reduced and survival increased by the following suggestions:**



**Avoid tobacco products and second-hand smoke.**



**Obtain cancer screenings as recommended.**



**Eat a nutritious and balanced diet.**



**Comply with recommended treatment or seek help with compliance.**



**Include about 30 minutes of physical activity daily.**



For more information about cancer control, please contact the Missouri Department of Health and Senior Services Comprehensive Cancer Control program at (573) 522-2840.